

COURSE SYLLABUS
Current as of February 1, 2018

Applied Data Analysis and Interpretation in Agriculture and Natural Resources

Course No.: AEC 6932	Instructor: Dr. Glenn D. Israel
Section No.: 256C	Office: 218 Rolfs Hall
Term: Spring, 2018	Office Hours: by appointment
Location: 306 Rolfs	E-mail: gdisrael@ufl.edu
Time: Tuesday, at 10:40 a.m. – 12:05 p.m. Thursday, at 10:40 a.m. – 12:05 p.m. Inform instructor about religious holidays	Telephone: 273-2586 (office) 339-6429 (cell)

Course Description: Concepts and methods drawn from the social sciences for analyzing data in the human dimensions of agricultural and natural resource issues.

Course Objectives: Upon completing the course, students should be able to identify a research question and conduct a process analyzing a data set using quantitative methods. Specifically, students should be able to:

1. Determine appropriate statistical techniques for a given research question and data set.
2. Conduct exploratory analyses to assess data quality and describe distributions of variables.
3. Implement data reduction strategies and assess measurement properties of constructs.
4. Conduct bi-variate analyses using tabular analysis, correlation and other methods.
5. Conduct multi-variate analyses using General Linear Model techniques (Manova, Mancova, Regression) or Log-Linear Models.
6. If appropriate, conduct an analysis using structural equation models or hierarchal linear models.
7. Prepare a report of the methods and results which is suitable for publication.

Text: There is no require text for the course. Instead students are expected to retrieve and read on-line journal articles listed below. In addition, each student should obtain a copy of SAS or SPSS statistical software (the instructor uses SAS and SPSS) for his or her personal computer.

Students may wish to purchase the following book as a supplemental reference for the course:

Vaske, Jerry J. 2008. *Survey Research and Analysis: Applications in Parks, Recreation and Human Dimensions*. State College, PA: Venture Publishing Inc. ISBN-10: 1-892132-79-6

Preparation: Students should have completed STA 6126 and 6127 (or equivalent) and a research methods course. An additional course on regression also is helpful.

Participation: In addition to attending each class, you should read assigned articles in a timely manner. Given the nature of the course, students are expected to participate in discussions for all scheduled classes.

Assignments:

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| 1. Proposed project for the semester. Provide title and one paragraph description of the research question and data to be used in the analysis. | 50 pts |
| 2. Meta-data report | 50 pts |
| 3. Imputation of missing data exercise. Select an imputation method, impute missing data and include syntax and output. | 100 pts |
| 4. Index construction exercise | 50 pts |
| 5. Descriptive analysis. Conduct appropriate descriptive analysis of variables in data set. Include syntax and output in an appendix. Draft table(s) for publication | 100 pts |
| 6. First draft of publication, including an appendix with output and syntax used in the analysis | 100 pts |
| 7. Regression/Analysis of Covariance exercise | 50 pts |
| 8. Logistic regression exercise | 50 pts |
| 9. Second draft of publication, including an appendix with output and syntax used in the analysis | 100 pts |
| 10. HLM exercise | 50 pts |
| 11. Student participation and oral report | 100 pts |
| 12. Final draft of publication, including an appendix with output and syntax used in the analysis | 200 pts |

Grading: Based on the project assignments and final report, the grade for the course will use the following scale:

A = 930 - 1,000 pts.	C = 730 - 769
A- = 900 - 929	C- = 700 - 729
B+ = 870 - 899	D+ = 670 - 699
B = 830 - 869	D = 630 - 669
B- = 800 - 829	E = 629 or fewer pts.
C+ = 770 - 799	

Online course evaluation process: Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available at <https://evaluations.ufl.edu/results/>.

Course Schedule

Date:	Topic:	Readings for class
Jan. 9,11	Introduction and Research question selection Exploring data structures & descriptive statistics, inc. nested data	1, 2
Jan. 16, 18	Assessing Bias in survey data Using plots and graphs/Descriptive statistics	3 (Project abstract due)
Jan. 23, 25	Dealing with missing data: Imputation methods	4, 5, 6 (Meta-data report due 1/25)
Jan. 30, Feb. 1	Measurement issues: index construction with Principle components; Indexes cont.: Factor analysis	(Imputation exercise due 2/1)
Feb. 6, 8	Tabular analysis Moderator/Mediator variables	7 8, 9 (Index exercise due 2/8)
Feb. 13, 15	Survey weighting	(Table(s) with descriptive analysis due 2/15)
Feb. 20, 23	No class – Israel to WERA-1010	
Feb. 27, Mar. 1	Regression	
Mar. 6, 8	No class – Spring break	
Mar. 13, 15	Dummy variables in regression ANOVA & MANCOVA	10 (1 st draft of paper due)
Mar. 20, 22	Regression diagnostics; Collinearity assessment Logistic regression	11, 12 (Regression exercise due 3/22)
Mar. 27, 29	Logistic regression (cont.)	
Apr. 3, 5	Ordinal & multinomial logistic regression; Poisson regression Student updates	Logistic regression exercise due 4/5)
Apr. 10, 17	Effect size calculations Student updates Hierarchal Linear Models (HLM): Two-level models	(2 nd draft of paper due 4/17) 13, 14 15
Apr. 24	HLM: Three-level models, Growth models Intro to Structural equation models (SEM)	16, 17 (HLM exercise due)
May 1	Final paper due	

Reading Assignments:

- (1) Newberry, III, M. G., O'Leary, J. L., & Israel, G. D. 2014. The Savvy Survey #15: Survey Responses and Data Entry. Gainesville: UF/IFAS s. Available at: <http://edis.ifas.ufl.edu/pd079>
- (2) Newberry, III, M. G., O'Leary, J. L., & Israel, G. D. 2014. The Savvy Survey #16: Data Analysis and Survey Results. Gainesville: UF/IFAS. Available at: <http://edis.ifas.ufl.edu/pd080>.
- (3) Israel, G. D., & Newberry, III, M. G. Assessing Bias in Uni-mode and Mixed-mode Surveys: Are Mixed-Mode Surveys Better? Paper presented at the VI European Congress of Methodology, Utrecht, Netherlands, July, 2014.
- (4) Joseph L. Schafer and John W. Graham. 2002. Missing Data: Our View of the State of the Art. *Psychological Methods*, 7(2), 147-177.
- (5) Roderick J. A. Little. 1988. Missing-Data Adjustments in Large Surveys. *Journal of Business & Economic Statistics*, 6(3), 287-296.
- (6) Yang C. Yuan. Multiple Imputation for Missing Data: Concepts and New Development.
- (7) Glenn D. Israel. 1992. Elaborating Program Impacts Through Data Analysis. Fact Sheet PEOD-3. Gainesville, FL: PEOD.
- (8) Reuben M. Baron and David A. Kenny. 1986. The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- (9) Jill A. Bennett. 2000. Mediator and Moderator Variables in Nursing Research: Conceptual and Statistical Differences. *Research in Nursing & Health*, 23, 415-420.
- (10) Lincoln Polissar and Paula Diehr. 1982. Regression Analysis in Health Services Research: The Use of Dummy Variables, *Medical Care*, 20(9), 959-966.
- (11) John Bibby. 1977. The General Linear Model: A Cautionary Tale. Pages 51-59 in Colm A. O'Muircheartaigh and Clive Payne (eds.), *The Analysis of Survey Data. Volume 2: Model Fitting*. John Wiley & Sons.
- (12) David A. Belsley. 1991. A Guide to Using the Collinearity Diagnostics. *Computer Science in Economics and Management*, 4, 33-50.
- (13) Jacob Cohen. 1992. A Power Primer. *Psychological Bulletin*, 112(1), 155-159.
- (14) Ferguson, C. J. 2009. An Effect Size Primer: A Guide for Clinicians and Researchers. *Professional Psychology: Research and Practice*, 40, 5, 532-538. DOI: 10.1037/a0015808.
- (15) *Israel, G. D., Myers, B., *Lamm, A. J., & Galindo-Gonzalez, S. 2012. CTE impact on science achievement: Does level of involvement and specialization matter? *Career and technical education research journal*, 37(1), 3-20. doi: 10.5328/cter37.1.3
- (16) Judith D. Singer. 1998. Using SAS Proc Mixed to Fit Multilevel Models, Hierarchical Models, and Individual Growth Models. *Journal of Educational and Behavioral Statistics*, 24(4), 323-355.
- (17) Mathew Hankins, David French and Rob Horne. 2000. Statistical Guidelines for Studies of the Theory of Reasoned Action and the Theory of Planned Behavior. *Psychology and Health*, 15, 151-161.
- (18) TBD on the topic of structural equation models

Additional References:

- (19) Glenn D. Israel. 1992. Determining Sample Size. Available at: <http://edis.ifas.ufl.edu/pdffiles/PD/PD00600.pdf>
- (20) AAPOR. 2011. *Standard Definitions*, Final Dispositions of Case Codes and Outcome Rates for Surveys. 7th Edition. Available at: http://www.aapor.org/uploads/standarddefs_4.pdf.
- (21) Savvy Survey Series. Available at: http://edis.ifas.ufl.edu/topic_series_savvy_survey

Data sets available from the instructor for the Course Project (and related publications):

1. Student-supplied, instructor-approved data sets

2. Small Farms Survey data, 1989

Israel, G.D. 1991. "Reaching Extension's Clientele: Exploring Patterns of Preferred Information Channels Among Small Farm Operators." *Southern Rural Sociology*, 8(1):15-32.

3. Small Farms Survey data, 2008 (n=275)

Gaul, S. A., Hochmuth, R. C., Israel, G. D., & Treadwell, D. 2009. *Characteristics of small farm operators in Florida: Economics, demographics, and preferred information channels and sources*. WC088, 7 pp. Gainesville: University of Florida Institute of Food and Agricultural Sciences. Available at: <http://edis.ifas.ufl.edu/wc088>.

4. Extension Customer Satisfaction Survey, 2003-2017 (n=9000+)

Israel, G. D., & Galindo-Gonzalez, S. 2009. Diverse Market Segments and Customer Satisfaction: Does Extension Serve All Clients Well? *Journal of international agricultural and extension education*, 16(1), 89-103.

Strong, R., & Israel, G. D. 2009. The Influence of Agent/Client Homophily on Adult Perceptions about Extension's Quality of Service. *Journal of southern agricultural education research*, 59(1), 70-80.

Galindo-Gonzalez, S., & Israel, G. D. 2010. The Influence of Type of Contact with Extension on Client Satisfaction. *Journal of extension*, 48(1), available at: <http://www.ioe.org/ioe/2010february/a4.php>.

5. Florida Horse Owner Survey, 2005 (n=615)

Israel, G.D. & Wilson, K.M. 2006. "Sources and Channels of Information Used By Educational Program Clients." *Journal of applied communications*, 90(4):55-78.

6. Lake User Survey, 2005 (n=965)

Hoyer, M. V., Israel, G. D. & Canfield, D. E. 2006. "Lake User's Perceptions Regarding Impacts of Lake Water Level on Lake Aesthetics and Recreational Uses" Gainesville, FL: University of Florida. 145 pp.

7. Florida Yards & Neighborhoods evaluations, 1999-2004, 2010-12 (n=400+; n=480+)

Israel, G.D., Easton, J.O. & Knox, G.W. 1999. "Adoption of Landscape Management Practices by Florida Citizens." *HortTechnology*, 9(2): 262-266.

Israel, G. D., Kochert, J. L., Scalera, S. A., & Monaghan, P. F. Uncovering Barriers to Changing Homeowner Landscaping Practices. Presentation at the 17th International Symposium on Society and Resource Management, Masdison, WI, June, 2011.

8. NELs:88 public use data, Base year – third follow-up (n=~20,000)

Beaulieu, L.J., Israel, G.D., Hartless, G., & Dyk, P. 2001. "For Whom Does the School Bell Toll? Multi-contextual Presence of Social Capital and Student Educational Achievement." *The Journal of Socio-Economics*, 30: 121-127.

Israel, G.D., Beaulieu, L.J. & Hartless, G. 2001. "The Influence of Family and Community Social Capital on Educational Attainment." *Rural Sociology*, 66(1): 43-68.

Israel, G.D. & Beaulieu, L.J. 2004. "Laying the Foundation for Employment: The Role of Social Capital in Educational Achievement." *The Review of Regional Studies*, 34(3):260-287.

Israel, G.D. & Beaulieu, L.J. 2004. "Investing in Communities: Social Capital's Role in Keeping Youth in School." *Journal of the Community Development Society*, 34(2):35-57.

9. ECLS-K public use data (Early childhood longitudinal study), Kindergarten-first grade

10. Florida Farm-to-School Partnership: School Principal Survey, 2013-14 (n=542)

Israel, G. D., Freer, T. J., & Galindo-Gonzalez, S. 2014. *Florida Farm to School Partnership: Findings from the School Principal Survey*. Gainesville, FL: author. 21 pp.

11. Climate Change in Florida, 2016-2017 (Qualtrics online panel, n=514; ABS mail survey, n=317)

Note: use of any data set must comply with University of Florida policies concerning research involving human subjects.

Relevant Websites:

Very useful web site with examples and syntax for multivariate analysis:

<https://stats.idre.ucla.edu/#>

<https://stats.idre.ucla.edu/spss/>

<https://stats.idre.ucla.edu/sas/>

Statsoft Electronic Statistics Textbook

<http://www.statsoft.com/textbook/stbasic.html>

Web Pages that Perform Statistical Calculations

<http://statpages.org/>

Grades and Grade Points

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Absences and Make-Up Work

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see:

<http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php>.

Software Use:

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources

Health and Wellness

U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS) Student Health Care Center, 392-1161.

University Police Department, 392-1111 (or 9-1-1 for emergencies). <http://www.police.ufl.edu/>

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learningsupport@ufl.edu. <https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601.

Career assistance and counseling. <http://www.crc.ufl.edu/> Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.

<http://teachingcenter.ufl.edu/>

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.

<http://writing.ufl.edu/writing-studio/>

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaintprocess>

Services for Students with Disabilities

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodations. Students with disabilities should follow this procedure as early as possible in the semester.